GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Manny Patel

FROM: Jeng-Hon Su

DATE: March 12, 2019

Facility Name:	**Southern Graphic Systems, LLC.**
AIRS No.:	04-13-067-00252
Location:	Marietta, GA (Cobb County)
Application #:	26959
Date of Application:	February 20, 2019

Background Information

Southern Graphic Systems, LLC. (hereinafter "facility") is an existing flexographic plate manufacturing facility located at 3045 Chastain Meadows Parkway in Marietta (Cobb County). The facility is a synthetic minor source and currently operates under Permit No. 3555-067-0252-S-01-0.

In general, the plates are made by curing the print image film to a polymer sheet by use of UV light exposure. The portion of the film that is not exposed to UV light is washed out, leaving the image on the polymer sheet. The facility recycles and reuses the spent solvent in a distillation unit on-site. The polymer sheet is the coated with a primer and adhesive as is the mounting plate to which it is joined. The edges of the final plate are sealed.

The facility manufactures two types of flexographic plates: Sheet Photopolymer Flexographic Plates (SPFP) and Liquid Polymer Flexographic Plates (LPFP). In the SPFP process, the facility currently operates four solvent based plate processors (ID Nos. PPD1, PPD3, PPD4, and PPD5) and two water based plate processors. In the LPFP process, the facility currently operates two plate processors. The solvent based SPFP processors are the only significant emission sources.

Purpose of Application

The facility submitted Application No. 26959 dated February 20, 2019 for the following:

- To modify its synthetic minor VOC emission limit from below 25 tons per year (tpy) to below 100 tpy due to the re-classification of the Atlanta non-attainment area.
- To install two solvent based SPFP processors (ID Nos. PPD2 and PPD6)
- To install one water based SPFP processor.
- To install one solvent recovery and recycle distillation unit (ID No. ST02).

A public advisory for this application was issued on March 6, 2019 and will be due on April 5, 2019.

Updated Equipment List

The table below only includes significant emission units, after the proposed modification, at the facility.

Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Source Code**	**Description**
PPD1	Plate Processor	02/2012	N/A	None
PPD3	Plate Processor	02/2012	N/A	None
PPD4	Plate Processor	12/2014	N/A	None
PPD5	Plate Processor	08/2018	N/A	None
PPD2	**Plate Processor**	**04/2019**	**N/A**	**None**
PPD6	**Plate Processor**	**04/2019**	**N/A**	**None**

* New significant emission units proposed by Application No. 26959 are in bold.

Emissions Summary

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	**After Mod.**	**Emissions Change**	**Before Mod.**	**After Mod.**	**Emissions Change**
$PM/PM_{10}/PM_{2.5}$	0	0	0	0	0	0
NOx	0	0	0	0	0	0
SO_2	0	0	0	0	0	0
CO	0	0	0	0	0	0
VOC	<25	<100	75	<25	<100	75
Max. Individual HAP	<10	<10	0	<10	<10	0
Total HAP	<25	<25	0	<25	<25	0
Total GHG (if applicable)	0	0	0	0	0	0

Regulatory Applicability

All plate processors are subject to the visible emission limit (40 percent opacity) specified in Georgia Air Quality Control Rule 391-3-1-.02(2)(b) "Visible Emissions" and the PM emission limits specified in Georgia Air Quality Rule 391-3-1-.02(2)(e) "Particulate Emission from Manufacturing Processes." Since all of them are constructed after July 2, 1968, their allowable PM emission rates are specified by Georgia Rule 391-3-1-.02(2)(e)1.(i), which is stated as follows:

$E = 4.1 * P^{0.67}$ for process input weight rate up to and including 30 tons per hour.
$E = 55 * P^{0.11} - 40$ for process input weight rate above 30 tons per hour.

Where E equals the allowable PM emission rate in pounds per hour and P equals process input weight rate in tons per hour.

Due to the nature of the operation, the Division believes that all the plate processors would generate negligible PM and visible emissions; their compliance with the GA Rule (b) and (e) emission standards are expected.

GA Rule (tt) and RACT Determination

Since the facility is located in Cobb County, its VOC cap is raised above 25 tpy, and it is not subject to any specific GA VOC rules, the facility is subject to the Reasonably Available Control Technology (RACT) requirements specified in Georgia Rules for Air Quality Control 391-3-1-.02(2)(tt)1. The facility submitted a VOC RACT Plan on February 20, 2019 for all of its emission units. The Division's VOC RACT Determinations are as follows:

- Potential VOC emissions from all the processes/emission units other than the six solvent based SPFP processors are so small that they do not warrant a VOC RACT for the emission units.

- The washout and dryers of each solvent based SPFP processors are the main source of VOC. The facility provided the following top-down list for potential VOC RACT –

    - Thermal Oxidation
    - Catalytic Oxidation
    - Carbon Adsorption
    - Chilled Condensers
    - Material Substitution
    - Proper Equipment Design, Work Practices, and Maintenance

- The facility ruled out some of the potential VOC RACT because –

    - Carbon Adsorption is determined to be technically infeasible because the targeted VOCs have an average molecular weight greater than 130, and therefore are difficult to be recovered from the activated carbon bed, and thus affect the bed's ability to adsorb more VOCs.

    - Chilled Condensers are determined to be technically infeasible because the exhaust VOC concentration, 153 ppmv, is too low. The facility cited U.S. EPA that chilled condensers are used to control streams with VOC concentrations above 5,000 ppmv. Use of a chilled condenser is not only ineffective but would also increase the facility's water demand and generate additional wastewater.

    - Material Substitution is determined to be technically infeasible because using low vapor pressure materials, in practice, it showed no reduction in VOC emissions. If the facility opts to measure the actual VOC emissions instead of assuming all VOC would become airborne (mass balance), it would require testing for each type of low vapor pressure material. The facility claimed that testing, which requires draining all processors/distillation units, cleaning all equipment, introducing new materials to the equipment, and running the new materials for several months to establish a reliable "usage" count, would be costly, and would most like impact production delivery timelines.

- For the remaining available RACT options, the facility ruled out the following potential VOC RACT based on economical infeasibility –

  - The facility estimated the annualized cost effectiveness for Thermal Oxidation as USD$16,851 per ton VOC removed. Therefore, the facility claimed that Thermal Oxidation is not cost effective.

  - The facility estimated the annualized cost effectiveness for Catalytic Oxidation as USD$11,498 per ton VOC removed. Therefore, the facility claimed that Catalytic Oxidation is not cost effective.

- The only remaining VOC RACT option that is both technically and economically feasible is Proper Equipment Design, Work Practices, and Maintenance. The facility proposed the following work practices:

  - Keeping VOC containing material containers closed while not in use.
  - Prompt cleanup of spills.
  - Prompt repair of drips.
  - Storage of VOC-laden cleaning rags in closed containers.
  - Manage washout time and temperature.
  - Transfer thick plate work to Liquid Photopolymer Lines where possible (which will result in a reduction in VOC emissions).
  - Manage solvent quality that is produced in the distillation units.

The Division agrees with the facility's RACT determination that the VOC RACT is Proper Equipment Design, Work Practices, and Maintenance. The proposed work practice standards are now included in Condition 2.5 of the proposed SIP permit as its VOC RACT requirements.

Note that Georgia Rules for Air Quality Control 391-3-1-.02(2)(tt)6. requires that a public notice be issued to provide an opportunity for public comments and hearing on the VOC RACT determination.

Permit Conditions

Condition 2.1 limits the facility-wide VOC emissions below 100 tpy to avoid being major under Title V of 1990 CAAA.

Condition 2.2 limits the facility-wide single/combined HAP emissions below 10/25 tpy to avoid being major under Title V of 1990 CAAA.

Condition 2.3 subjects all processes to the GA Rule (b) visible emission standard.

Condition 2.4 subjects all processes to the GA Rule (e) PM emission standards.

Condition 2.5 contains the approved VOC RACT requirements. Paragraphs a. through g. contains the work practice standards proposed by the facility. Paragraph h. requires that the facility conduct weekly inspection and documentation to ensure compliance with the work practice standards.

Conditions 7.1 through 7.3 includes the record keeping requirements for the facility to demonstrate compliance with the VOC synthetic minor (SM) limit specified in Condition 2.1. If any monthly VOC emissions are over 8.33 tons or any 12-month rolling totals are over 100 tons, the facility is required to

notify the Division within 15 days of the following month and explain how the facility intends to attain compliance.

Conditions 7.4 through 7.6 includes the record keeping requirements for the facility to demonstrate compliance with the single/combined HAP SM limits specified in Condition 2.2. If any monthly single/combined HAP emissions are over 0.83/2.08 tons or any 12-month rolling totals are over 10/25 tons, the facility is required to notify the Division within 15 days of the following month and explain how the facility intends to attain compliance.

Toxic Impact Assessment

Since the single/combined HAP emissions are still capped below 10/25 tpy, the modification is not expected to cause any increases in potential single/combined HAP emissions. Therefore, no toxic assessment is required for the modification.

Summary & Recommendations

I recommend that SIP Permit No. 3555-067-0252-S-02-0 be issued to the facility. A public advisory for this application was issued on March 6, 2019 and will be due on April 5, 2019. As required by Georgia Rules for Air Quality Control 391-3-1-.02(2)(tt)6., the Division will first issue the proposed permit as a draft permit. The facility will be required to publish the public notice in the local news organ. SSCP is responsible for inspections and complaints/investigations.